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## ABSTRACT

This handbook explains the components of the North Carolina Career Information and Guidance Data Base. (This database is a three-volume statewide career information and guidance system that is being built to offer counselors and clients computerized access to standardized occupational and educational information.) Outlined in the handbook are the following sections of the database: the educational information file (its purpose, procedures, content, and organization); the occupational information file (a general description of the file, the history of its development, and the files' standard occupational classification or SOC descriptions); the employment outlook section (current and projected supply and demand, the interpretation and analysis of supply-demand interaction, the limitations of supply-demand analysis, and wage information); and the disability section (the purpose of the section, differences between the terms handicap and disability, and disability philosophy). Appendixes to the handbook include lists of signatory committee members and alternates of the North Carolina State Occupational Information Coordinating Committee, state and local technical advisory committee members, task force members, SOC description writers, and North Carolina favorable occupations. (MN)

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HANDBOOK FOR CAREER INFORMATION:  
THE NORTH CAROLINA  
CAREER INFORMATION AND GUIDANCE SYSTEM DATA BASE

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NORTH CAROLINA  
STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

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## FOREWORD

### THE NORTH CAROLINA STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

There does not exist in any state a statewide multi-purpose occupational and career information system. North Carolina has taken the lead among the states in developing this valuable service through its North Carolina State Occupational Information Coordinating Committee (NCSOICC).

Each state is mandated by Congress to establish a State Occupational Information Coordinating Committee. The SOICCs, under the National Occupational Information Coordinating Committee (NOICC), are intended to develop a state network for occupational and career information. The NOICC/SOICC network was established by Congress in the Education Amendments of 1976 (PL 94-482) and the Youth Employment Demonstration Project Act of 1977 (PL 95-93). These two laws mandate that SOICCs develop and implement (1) an occupational information system (OIS) designed to meet the common occupational information and data needs of the vocational education programs and employment and training programs, and (2) a career information system (CIS) to assist and encourage the use of occupational information by people involved in the career decision-making process.

During the summer of 1977, Governor James B. Hunt became acquainted with the legislation mandating NOICC/SOICCs and decided to move rapidly to establish the North Carolina SOICC. The initial interest and continued support of the Governor have been of decisive importance in the growth of a strong SOICC.

The North Carolina State Occupational Information Coordinating Committee was established in June 1977 with the Inter-Agency Agreement signed in September 1977. The Statutory Committee is composed of the representatives as required by PL 94-482, Section 161 (b):

- . A representative of the Employment Security Commission
- . A representative of the State Board of Education (vocational education agency)
- . A representative of the State Manpower Service Council
- . A representative of the agency administering the Vocational Rehabilitation program

The North Carolina SOICC's general purpose is improving coordination, communication, and cooperation in the development of a multi-purpose occupational information system designed (1) to meet the common occupational information data needs of the vocational education program and the employment and training programs, and (2) to give special attention to the problems of unemployed youth (and other citizens) through the use of occupational information by promoting its use in career decision-making.

The basic organizational structure of the North Carolina SOICC is the aforementioned Statutory Committee, which has the governing, policy-making, and voting authority in which each of the four Signatory Agencies has a veto over all NCSOICC policy decisions. Complementing and expanding the work of this Statutory Committee are the Technical Advisory Committee, the Full SOICC Committee, and a Task Force. (Members of the Signatory Committee, the Advisory Committee, and the Task Force are listed in Appendix A, Appendix B, and Appendix C, respectively.)

During the fall of 1977, we began to plan and develop a truly comprehensive occupational and career information system. We decided that our multi-purpose information system should be developed in two distinct but overlapping stages: (1) occupational information for state agency management and planning of vocational education and other manpower training programs and career information; (2) occupational and career information for career exploration and decision-making by the clients of education and training programs, as well as other programs.

We decided not to import in toto one of the existing computerized career information systems because we found that they each had important deficiencies:

- (1) We wanted to give our clients North Carolina specific information. We found that it would take as long as three years to convert the information in a system which we might import to be able to do this.
- (2) North Carolina has one of the largest American Indian concentrations and the third largest Black minority of any state. Some of the existing information systems do not take their needs sufficiently into account.
- (3) We in North Carolina did not want our career information system to have any of the rigidity that is present, for example, in programmed learning. We wanted to develop and intend to create an interactive system with many and varied paths for the clients to enter and leave the information.

- (4) We wanted one system which would not only contain and deliver career information but also allow for the analysis, access, and use of detailed labor market information which must be contained in an OIS. Further, we wanted the occupational data on a comparable basis. None of the existing systems has this information related in the ways our people feel it must be.

In keeping with our decision to develop North Carolina specific information initially, a decision had to be made on the structure for the occupational descriptions. In January 1978, the SOICC Technical Advisory Committee recommended that North Carolina adopt the Standard Occupational Classification (SOC), prepared by the Office of Management and Budget and published in manual form by the U.S. Department of Commerce, as the basis for occupational descriptions for our multi-purpose system. The SOC clusters occupations according to similarity of work performed. This structure met our needs very well. In our long-range plan, we anticipate that linkage of the career information component to the OIS component of our multi-purpose system will take place through the SOC occupational clusters.

Of course, information to support career decision-making is not required at the degree of occupational specificity that is required for education and training program planning. What is required is more generalized information about families of similar occupations that will allow individuals to explore career options across a number of relatively broad occupational specialities. The difference lies in detail.

Knowledge of the prospects for employment in terms of supply and demand estimates is equally as useful for individual decision-making as it is for planning education and manpower programs. Correspondingly, information on duties, requirements, wages, and other information pertaining to jobs is equally as useful to program and curriculum development specialists as it is to individuals seeking information on which to base career choices.

In developing the career information component, we began by building our data base. We have accomplished the intensive work of converting the information in the new Fourth Edition Dictionary of Occupational Titles and the new Standard Occupational Classification Manual into usable form for North Carolina users. This has been accomplished by eight competent writers whose work was supported by a \$175,000 CETA contract. We have developed 627 occupational cluster descriptions, built around the Standard Occupational Classification, which describe virtually every type of job in North Carolina, as well as in the United States. In addition, we have developed descriptions for 30 North Carolina "specific" occupations.

This descriptive information includes: what the work is about, what general things you would do, what you must be able to do, what

specific activities you might perform, where you would work, what the work place is like, how you would prepare to enter the field, what opportunities are available, what is your employment outlook, things you should consider if you have a disability, licensing and certification information, and a miscellaneous category on the subject of what else you should know.

Detailed information on education and training programs, including secondary school vocational education programs and all post-secondary education and training programs for the state have been prepared.

The North Carolina SOICC plans to continue the process of developing additional information, to complete the task of editing and revising the occupational and training descriptions that have been written, to prepare training programs for counselors to make effective use of this new career information, and to conduct training programs in the use of this newly developed information for counselors working the offices of ESC, VRS, DPI, and Community Colleges, CETA, and other appropriate agencies.

Career paths are not easily defined. Focusing on complete and accurate information is the key. A person successful at finding work ceases to be an unemployment statistic. A student who locates a scholarship is one more talented individual contributing to his or her field. A handicapped individual who becomes aware of specialized training and work opportunity is one less person dependent on the support of others. The benefits of the new North Carolina career guidance information system are human benefits.

Joyce F. Kinnison  
Executive Director  
North Carolina  
State Occupational Information  
Coordinating Committee

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## INTRODUCTION

The major thrust of vocational education since the passage of the Smith-Hughes Act of 1917 has been to offer citizens training that would lead to the development of skills necessary to employment in viable occupations. Basic to this endeavor are the identification of occupations characterized by the need for trained personnel and the implementation of programs designed to train individuals so that they can fill the needs of the employment sector. In order for vocational educators to choose training programs wisely and in order for individuals to choose wisely from among available training programs, clear, concise, comprehensive, and accessible occupational information must be made available in standardized form (i.e., in a form in which the nomenclature, content, and format are common across the local, state, and federal agencies that collect, analyze, and/or utilize occupational information).

The need for standardization of occupational information has been recognized in such recent legislation as the Emergency Jobs Program Extension Act of 1976 and the Education Amendments Act of 1976. The Education Amendments Act established a National Occupational Information Coordinating Committee (NOICC) and a system of State Occupational Information Coordinating Committees (SOICCs) whose specific responsibilities are to develop and implement occupational information systems at the national and state levels.

In March of 1978, the North Carolina SOICC (NCSOICC) received CETA funds from the Division of Community Employment of the North Carolina Department of Natural Resources and Community Development to provide: (1) information for career guidance to be used in both the Balance-of-State and its local Prime Sponsors Title III Youth Employment and Training Programs, and (2) support for the development of a statewide comprehensive career information and guidance system. It was felt that such a system would be of great value in the delivery of guidance services throughout North Carolina and would allow CETA clients (in particular) to make more intelligent and well-founded decisions with regard to careers and training. The types of information to be provided included:

- (1) Descriptions of the job duties, physical demands (where sources are known and documented), working conditions, hiring conditions, and employment outlook for a defined set of occupational clusters.
- (2) A description of the type of preparation, skills, and licensing required for specific occupations.

- (3) General information on secondary, career and vocational education programs, post-secondary education in North Carolina, including community colleges, technical institutes, proprietary institutions, and two- and four-year colleges and universities (including enrollment, admissions standards, costs, and programs of study).

The three-volume North Carolina Career Information and Guidance System Data Base is a product of the five-month CETA/SOICC project described above. These volumes contain the career information data base upon which a statewide career information and guidance system is being built to offer counselors and clients computerized access to standardized occupational and educational information. Volume I, the Educational Information File, contains information about educational institutions and programs that exist within the State of North Carolina. Volumes II and III, the Occupational Information File, contain descriptions of 627 occupational clusters (or groups of similar occupations).

The 627 cluster descriptions in the Occupational Information File are based on the Standard Occupational Classification (SOC) system. This system was developed by the Office of Management and Budget (OMB) for use in data collection and analyses for a variety of purposes by both government and private research organizations. The SOC, in essence, clusters (or groups) the 20,000 occupations described in the Dictionary of Occupational Titles, Fourth Edition (DOT), on the basis of similarity in worker activity. The SOC provided the framework for writing the 627 occupational cluster descriptions.

The descriptive material in these volumes is based upon the best available, current information about occupations and educational institutions and offerings. The Occupational Information File presents North Carolina specific information (where available) regarding employment outlook, wages, and licensing requirements. Planned future enhancements of the system include the presentation of this and other information on the local, regional, state, and federal levels.

It is suggested that counselors can best make use of these documents by first understanding their intent and structure. To facilitate this understanding we have included in this brief Handbook descriptions of: (1) the sources and methods used to compile the information, (2) the content and structure of the information, and (3) the impetus and goals that have triggered and guided our efforts.

It should be noted that the information in these volumes is in draft form. Plans exist for the revision, expansion, and refinement of information both prior to and during computer system development. We actively seek and encourage your suggestions and criticisms to enable us to improve further the North Carolina SOICC Career Guidance Service.

## II

### THE EDUCATIONAL INFORMATION FILE

by

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#### Introduction and Purpose

The Educational Information File (Volume I) contains descriptions of accredited educational institutions in North Carolina and a listing of the educational programs offered at those institutions.

The basic purpose of this section of the North Carolina Career Information and Guidance System Data Base is to provide users with easy access to information about educational institutions in North Carolina. Presently, the educational file contains program offerings and descriptions of accredited educational institutions only. However, in later editions, it is our intent to include not only descriptions of accredited educational institutions and programs offerings but also descriptions of trade-schools, manpower programs, and continuing education programs. In addition, the program offerings section will include a description of programs available at all educational institutions in North Carolina.

It should be noted here that the information contained in the educational file will change constantly because of changes which occur within the educational institutions described. This updating will be done on an annual basis while the information is in manual form. This updated information will be provided to users.

## Procedures

Our first task in developing the Educational Information File was to determine what types of information about educational institutions should be included in the file. A specialist in vocational and occupational research undertook the research effort to determine what types of information about institutions are most important to potential students. After this determination was made, a group of experienced individuals with backgrounds in education, CETA, and career counseling reacted to the findings of this specialist. After careful thought and discussion, it was recommended that thirteen (13) types of information be used in describing educational institutions. (A list of these thirteen types of information about institutions is given on Page

Once the information content had been established, the institution descriptions were compiled using the following procedures:

- (1) Reference materials to be used in compiling the education information were identified. These included:  
(1) college catalogues; (2) the Statistical Abstract of Higher Education; (3) the University of North Carolina Long Range Planning 1977-82; (4) the College Reference System, compiled by the North Carolina Association of Independent Colleges and Universities; (5) the North Carolina Facilities Inventory and Utilization Study; (6) the 1976-78 Educational Guide, published by the Division of Community Colleges and Technical Institutes; and (7) the Educational Directory of North Carolina 1977-78, issued by the State Department of Public Instruction.
- (2) Once the reference materials were identified, a four-member team began writing description drafts.
- (3) These rough drafts were then proofed and entered into a computer via the Management Information Text Storage (MITS) System for storage and further editing.
- (4) In order to insure the validity of the descriptions, copies of the institution descriptions were sent to officials at each of the institutions described. These officials were asked to review the materials and to note any corrections, additions, and deletions they felt should be made.
- (5) Finally, the institution descriptions were revised to reflect any changes made by the officials who reviewed them.

## Content

The Educational Information File contains descriptive information about five (5) major categories of educational institutions. These categories are:

- (1) Community Colleges and Technical Institutes - These refer to two-year public institutions through which vocational, technical, or associate degrees may be obtained.
- (2) Private Junior Colleges - These refer to two-year independent institutions which are accredited to award associate degrees.
- (3) Private Senior Institutions - These refer to private four-year colleges and universities which may award bachelors, masters, and/or doctoral degrees.
- (4) Public Universities - These refer to state-supported institutions which may confer bachelors, masters, and doctoral degrees.
- (5) Proprietary/Other Schools - These refer to privately owned educational institutions which offer programs to prepare students for occupations in trades or vocations.

As was mentioned before, the File contains a listing of programs offered at the five major types of educational institutions previously described. In addition, it also contains information about high school vocational programs.

## Organization

The Educational Information File contains seven (7) major sections. These sections are described below in the order in which they appear in the document.

### Sections 1 through 5: The Regional and Individual Institution Descriptions

Sections 1 through 5 contain descriptive information about each of five (5) major types of educational institutions. The sections are as follows:

Section 1 - Community Colleges and Technical Institutes

Section 2 - Private Junior Colleges

Section 3 - Private Senior Colleges and Universities

#### Section 4 - Public Universities

#### Section 5 - Proprietary/Other Schools

In each of the sections, information about institutions is presented in the following manner. First, the institutions located within each of the seventeen (17) multi-purpose planning regions are listed and described in "fact sheet" format. There is a fact sheet for each region in which there is an educational institution. These fact sheets contain such general information as entrance requirements, program lengths, types of degrees which may be obtained, the cost of tuition and required fees, etc. This type of information is presented for each of the five categories of institutions.

Although the regional information in this edition is organized only on the basis of the seventeen multi-purpose planning regions, in future publications the educational institutions will be grouped using other designations, such as SMSA regions, educational regions, etc.

Following the regional fact sheets are individual institution descriptions. These descriptions provide the user with information about the individual institutions located within the region. The following types of information are provided:

1. The name of the institution
2. The location of the institution
3. The program or program areas it offers
4. How to get information about the institution or apply
5. The number of students enrolled
6. The educational levels of the faculty
7. The student/faculty ratio
8. What agencies accredited the institution
9. The cost of tuition and other required fees
10. The number of students receiving financial aid
11. The average financial aid award
12. The types of financial aid available
13. The address of the financial aid officer

## Section 6: Matrix of Program Offerings

This section provides the user with a listing of programs offered at the following categories of institutions:

Technical Institutes and Community Colleges

Private Senior Colleges and Universities

Public Universities

Using this matrix, the user is able to access information about program offerings in two ways: (1) by program and (2) by institution. A segment of the matrix for Technical Institutes and Community Colleges is shown below.

### **PUBLIC COMMUNITY COLLEGES**

| AND                       |  |                     |                 |                      |           |                    |           |             |                 |            |                |
|---------------------------|--|---------------------|-----------------|----------------------|-----------|--------------------|-----------|-------------|-----------------|------------|----------------|
| TECHNICAL INSTITUTES      |  |                     |                 |                      |           |                    |           |             |                 |            |                |
| PROGRAMS                  |  | Central Piedmont CC | Cleveland Co TI | College of Albemarle | Craven CC | Davidson County CC | Durham TI | Edgecomb TI | Fayetteville TI | Forsyth TI | Gaston College |
| BUSINESS                  |  |                     |                 |                      |           |                    |           |             |                 |            |                |
| Accounting                |  | x                   | x               | -                    | x         | x                  | x         | -           | x               | -          | x              |
| Aviation Mgt & C Pilot    |  | -                   | -               | -                    | -         | -                  | -         | -           | -               | -          | x              |
| Banking & Finance         |  | -                   | -               | -                    | -         | -                  | -         | -           | x               | -          | x              |
| Business Administration   |  | x                   | x               | x                    | x         | x                  | x         | x           | x               | x          | x              |
| Computer Operator         |  | x                   | -               | -                    | -         | -                  | -         | -           | -               | -          | -              |
| Court Reporting           |  | -                   | -               | -                    | -         | -                  | -         | -           | -               | -          | -              |
| EOP-Business              |  | x                   | -               | -                    | -         | x                  | -         | x           | x               | x          | x              |
| Fashion Merchandise & Mkt |  | -                   | x               | -                    | -         | -                  | -         | -           | -               | -          | -              |

In this matrix, the letter "x" denotes that a program of a specific type is offered at an institution or institutions. In the segment the program "Computer Operator" is offered only at Central Piedmont Community College; while the program "Banking and Finance" is offered at three institutions: Central Piedmont Community College, Fayetteville Technical Institute, and Guilford Technical Institute.

The next segment illustrates the matrix for the categories of public universities and private senior colleges and universities. It should be noted that in addition to the programs offered, the matrix also provides information about the types of degrees which can be earned at the different institutions. This is done using the letters:

"B" represents bachelor degrees

"M" represents masters degrees

"D" represents doctoral degrees

PUBLIC FOUR-YEAR

COLLEGES

AND

UNIVERSITIES

FINE AND APPLIED ARTS

Fine Arts-general

Art

Art History & Appreciation

Music (Performing)

Music (Liberal Arts)

| Appalachian State | East Carolina | Elizabeth City St. | Fayetteville State | NC A and T | NC Central | NC School of Arts | NC State |
|-------------------|---------------|--------------------|--------------------|------------|------------|-------------------|----------|
| ---               | ---           | ---                | ---                | ---        | ---        | ---               | ---      |
| B--               | BM-           | ---                | ---                | B--        | B--        | ---               | ---      |
| ---               | B--           | ---                | ---                | ---        | ---        | ---               | ---      |
| B--               | BM-           | ---                | ---                | ---        | ---        | B--               | ---      |
| B--               | B--           | ---                | ---                | B--        | BM-        | ---               | ---      |

In the categories of Private Junior College and Proprietary/ Other Schools, the program offerings are found in the individual institution descriptions under the heading "What programs are offered."

Section 7: High School Vocational Programs

This section is included to give the user information about vocational programs offered at high schools. The first portion of this section contains brief descriptions of vocational programs available in high schools. The second part of this section contains a listing of names and addresses of the high schools offering these vocational programs.

### III

#### THE OCCUPATIONAL INFORMATION FILE

by

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#### General Description

The Occupational Information File contains descriptions of and information relevant to 627 occupational clusters. As was mentioned earlier, the clusters are based on the Standard Occupational Classification (SOC) system which groups the approximately 20,000 occupations in the Dictionary of Occupational Titles, Fourth Edition (DOT) on the basis of similarity in worker activity. A given SOC cluster may contain from as few as one to as many as 200 DOT occupations.

#### Purpose

The Occupational Information File is designed to present comprehensive, clear, concise, current, and relevant information about occupations. It contains information to help clients (e.g., youths, individuals making mid-life career changes, the underemployed, the disabled, etc.) make "good" decisions about careers and career paths.

#### Content

The occupational descriptions in the Occupational Information File contain information relevant to the following areas:

(1) job duties, (2) physical demands, (3) skill requirements, (4) working conditions, (5) hiring conditions, (6) type of preparation, and (7) licensing requirements. In addition, a special section addressed to the disabled is included to give information to individuals with physical, mental, or emotional conditions that might impact their decisions either to pursue a particular type of occupation or to exclude an occupation from consideration.

### Organization

The File consists of two volumes of SOC cluster descriptions: Volume II, which contains descriptions of SOC clusters 1110 through 5390; and Volume III, which continues the File with descriptions of SOC clusters 5512 through 9100. Two indices to the descriptions are provided: (1) an SOC index, which lists the cluster descriptions in numerical order by SOC code number and (2) an alphabetical index which lists the cluster descriptions alphabetically by SOC cluster title. The two indices are located in the front of Volume II.

The body of the description file is sub-divided into 20 major sections (e.g., Executive, Administrative, and Managerial Occupations, Engineers and Architects, Natural Scientists and Mathematicians, etc.). The cluster descriptions are presented in the File in numerical order by 4-digit SOC code. An SOC code and cluster title appear at the top of the first page of each of the cluster descriptions. Forty-nine of the SOC cluster titles are asterisked. These asterisks denote that the cluster contains North Carolina-favorable occupations (i.e., occupations in which the demand for skilled workers is expected to be high through the mid-1980s). The 49 North Carolina-favorable occupational clusters are also highlighted in the indices by asterisks preceding the cluster codes and titles.

### Source Materials

The occupational descriptions were written using the best available sources of current information related to occupations. The primary source materials used (including a core vocabulary used to determine word grade level) were:

- (1) The Standard Occupational Classification Manual, U.S. Department of Commerce, Office of Federal Statistical Policy and Standards, 1977.
- (2) The Dictionary of Occupational Titles (Fourth Edition), U.S. Department of Labor, Employment and Training Administration, 1977.

- (3) The Dictionary of Occupational Titles Occupational Classification (Volume II Supplement to the third-edition DOT), 1965.
- (4) The Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics, 1978.
- (5) A Revised Core Vocabulary: A Basic Vocabulary for Grades 1-8, EPL Research and Information Bulletin, 1969.

#### Reading Level

To insure the usability (i.e., readability) of the occupational information by the largest number of people and to accommodate the needs of youths, the disadvantaged, and other special needs groups, the descriptions were written at or near a fifth to seventh grade reading level.

#### Sex Bias

All references to gender and terms which were deemed to constitute a possible sex bias were systematically omitted from the descriptions.

#### The SOC

The SOC system was chosen as the basis for writing occupational descriptions because it offered several advantages over many available classification systems. These included the following:

- (1) The SOC has been designated as a federal standard for cross-referencing and collecting occupational information. (It is noteworthy that 1980 census data will be collected using the SOC classification system.)
- (2) The SOC covers virtually every occupation in the U.S. economy (i.e., it accounts for all occupations listed in the DOT in which work is performed for pay or profit).
- (3) The SOC contains a manageable number of occupational entities which, furthermore, are arranged into logical categories; thus it facilitates the presentation of occupational information that covers the spectrum of occupations in the world of work through the use of "windows" or "doors" to aggregates of similar work categories.

The SOC was designed for use by government agencies in collecting occupational data, planning occupational education and training programs, planning occupational research and analysis, planning and placement services, studying mobility of workers, and related activities dealing with occupational statistics. It is structured on a four-level system: division, major group, minor group, and unit group. Each level contains groupings in successively finer detail; thus information may be tabulated or analyzed on different levels. Residual categories exist which contain occupations that do not fit into a specific group. Each group contains a listing of DOT titles that are descriptive of the group. DOT listings for a group are unique to that group (i.e., they do not appear in any other group). All DOT titles are included in the SOC classification system. Selected occupational titles from the 1970 Census of Population Classified Index of Industries and Occupations are also included in the groups.

#### Development

It was early recognized that systematic procedures for writing the occupational descriptions were needed to insure the validity and reliability of the descriptions. Accordingly, a methodology for writing cluster descriptions was developed and systematized by independent consultants in collaboration with the project supervisor. The description-writing procedures were documented and two prototype descriptions were developed to be used as standards for descriptions writing. Furthermore, to insure that these systematic procedures were adhered to during project implementation, arrangements were made with the aforementioned consultants to provide ongoing quality control, through description reviews, throughout the description-writing period.

#### Training Package

A training package, consisting of an Instructor's Manual, Writers' Manuals, Training Exercises, and Viewgraphs, was developed for use in training the description writers. The training package, which was used in a five-day training session led by the project supervisor, included the following topics: (1) Use of the DOT, (2) Use of the SOC, (3) Use of the "Worker Trait" descriptions, (4) Use of the Occupational Outlook Handbook, and (5) General Instructions for Writing SOC Cluster Descriptions. An additional two days were devoted to practice in writing SOC cluster descriptions on a group and then on an individual basis, with feedback given to the writers both from the quality control sector and the project supervisor.

### The Description Writers

Care went into the selection of the writing staff. Writers were chosen on the basis of: (1) educational background, (2) demonstrable writing skills, and (3) professional experience relevant to human resources development, psycho-social research, service to youth, occupational analysis, and/or journalism. Adjunct members of the writing team included three subject-matter experts: (1) a vocational rehabilitation specialist, who prepared the disability sections of the occupational descriptions; (2) a reading-level specialist, who computed and reported the reading levels of the descriptions; and (3) a labor economist, who prepared the employment outlook sections of the descriptions. (The description writing team is described briefly in Appendix D.)

### Guidelines for Writing the Descriptions

The following guidelines were adhered to in writing the SOC cluster descriptions:

- (1) Descriptions were written for those SOC cluster levels (e.g., division, major group, etc.) that contained DOT titles and codes. SOC cluster levels that did not list DOT titles and codes were not described.
- (2) Each occupational cluster was written in such a way as to describe the majority of occupations in a cluster.
- (3) Occupations subsumed under an SOC cluster category that listed census codes rather than DOT codes were not utilized in writing the cluster descriptions.

### Methods

Description writing was an iterative process; each SOC cluster description was revised up to five times before the final draft was printed. The descriptions were revised in progression for content, reading level, and style. Each writer was initially assigned a block of approximately 20 clusters to describe. Each block contained clusters which were fairly similar in nature. The clusters were assigned in this manner to better enable the writers to discriminate between very similar clusters (i.e., since a writer read material relevant to both of two similar clusters, he/she was better able to describe each of the clusters in terms of those things that made them unique).

Each of the writers prepared a total of approximately 80 cluster descriptions. On a rotating basis, writers were assigned to review and edit the descriptions for content, reading level,

and style. Initially, the edited descriptions were also reviewed by the project supervisor; and comments, additions, and deletions were noted on the drafts for the writers' edification. Also, samples of each writer's work were periodically reviewed by the quality control consultants. Thus, feedback was afforded the writers on a continuing basis - from each other, from the project supervisor, and from the quality control monitors.

#### Reading-Level Checks

Approximately three-fourths of the cluster descriptions were reviewed for grade level, using an established reading diagnostic device, the "Fry."\* Descriptions for which the grade level was found to be high (i.e., above the seventh grade reading level) were rewritten by the project supervisor to conform to an acceptable level.

#### MITs Storage

As the descriptions were written, they were entered into a computer for storage via a Management Information Text Storage (MITs) terminal. The MITs system also provided the mechanism for editing and printing the descriptions.

#### The SOC Descriptions

Each of the SOC descriptions consists of two to three pages of information about a group of similar occupations. The descriptions are divided into thirteen (13) sections, each of which has a special content and purpose. Eleven of these sections are described below. The disability section and the employment outlook section are described in Sections IV and V, respectively, of this Handbook.

#### What The Work Is About

This first section presents a brief narrative description of the SOC cluster. It contains not more than three to four short, simple sentences in which the SOC cluster is described in such a way as to differentiate it from any other SOC cluster. This, in essence, is a mini-description of the occupational cluster. The entries in this section are based upon the cluster description given in the Standard Occupational Classification Manual and

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\* For more information, see Fry, E. B., "Fry's Readability Graph; Clarification, Validity, and Extension to Level 17," Journal of Reading, 21, No. 3 (December 1977).

upon selected readings in the DOT. An example from this section is: "CHILD CARE WORKERS take care of children. They do such things as dress, feed, bathe, and watch over them as they play."

#### What General Things You Would Do

This section of the occupational descriptions describes the rather broad activities that are typically performed by individuals who work in occupations within the cluster. Entries in this section:

- (1) begin with action verbs
- (2) tell what actions take place in relation to people, data, and things
- (3) are general enough to pertain to more than one specific occupation in the cluster
- (4) provide comprehensive coverage of broad categories of actions performed within the cluster as a whole.

In other words, looking at all the occupations listed within a cluster, this section extracts and describes those broad types of actions that are common to the majority of the occupations listed.

For example, the SOC cluster FIREFIGHTING AND FIRE PREVENTION SUPERVISORS contains 7 occupations: Fire Captain, Battalion Chief, Fire-Prevention Bureau Captain, Fire Marshall (any industry), Fire Marshall (government services), Fire-Investigation Lieutenant, and Fire Warden. The following general activities are performed by incumbents in most of these occupations. These people:

- manage and direct the work of firefighters
- enforce safety rules
- keep records of equipment
- read and write reports
- direct investigations and inspections
- teach and train people

Again, these are activities which are typically performed in MOST of, but not all of the occupations in the cluster. Not included are activities which occur in a few of but not most of the occupations. For example, a Fire-Investigation Lieutenant

and a Fire Marshall (government services) often give testimony in court cases involving fires, suspected arson, and false fire alarms. As this activity is not included in the DOT descriptions for the balance of the occupations subsumed in the cluster, it was not mentioned as a general activity for the cluster as a whole.

#### What You Must Be Able To Do

Entries in this section are based upon a synthesis of all reading materials related to the cluster, with special emphasis given to the following sections of the "worker trait" descriptions given in the Volume II supplement to the Dictionary of Occupational Titles, Third Edition.

- (1) worker requirements
- (2) aptitude codes and definitions
- (3) temperament codes and definitions
- (4) interest codes and definitions
- (5) physical demand codes and definitions
- (6) general educational development codes and definitions.

The ability section is intended to define the mental, physical, and other abilities that are typically necessary to successful performance of the job in most occupations settings. (It should be noted here that the abilities listed in this section are not intended to provide the basis upon which individuals with specialized limitations, such as those who have disabilities, should exclude an occupation from consideration. With changes in job settings, modifications in job duties, and performance aids, an individual can often perform well in an occupation, even if he/she lacks one or more of the abilities listed.)

Entries in this section begin with action verbs. They are designed to be general enough to apply to more than one DOT occupation in a cluster. They are intended to cover the range of abilities necessary for work in the cluster as a whole. Some typical entries in this section are:

- read and write well
- work with fractions, decimals, and percentages
- climb, balance, stoop, kneel, and crawl
- make quick and correct decisions

### What Specific Activities You Might Perform

This section lists detailed examples of typical activities that are performed by individuals who work in occupations that make up a cluster. These items are extracted from a representative sample of DOT descriptions. Entries in this section are aimed at showing richness of detail, contextual diversity, and activity specificity. Taken together, the entries in this section should suggest a wide range and variety of specific activities.

Each entry begins with an action verb, names the tools or equipment (when appropriate) used to perform the activity, and tells specifically what is acted upon. At least half of the items in this section should relate back to the general activities section. For example, the entry "read and write reports" in the general activity section may be followed in the specific activities section with the entry "prepare reports about accidents that involve fire fighters." The general activity section does not state what type of report is read or written, as the type of report dealt with may vary within an occupation and across occupations in a cluster. The specific activity section gives an example of a type of report written. For example, people who work in the occupations listed in the cluster FIREFIGHTING AND FIRE PREVENTION SUPERVISORS typically read and write reports (What general things you would do). To borrow our example above, one specific example of the type of report written is a report about accidents that involve firefighters (What specific activity you might perform). The specific activity may relate to only one or to one or more occupations in the cluster. It, therefore, is an activity that "might" be performed. It would be impractical to name all the types of reports that "might" be written (or read) by individuals in all the occupations in a cluster. (Some clusters contain more than 200 occupations!) Furthermore, it would not be useful (or parsimonious) to give the client that much information at this level of career exploration. What can best be done is to suggest a variety of activities in detail rich enough to pique the interest (or disinterest) of the client. Other examples of "what specific activities you might perform" are:

- train fire fighters how to use equipment
- direct an investigation of the suspected causes of a fire
- plan, order, and direct a fire drill.

### Where You Would Work

The information in this section was obtained from the SOC Industry Codes and Listings and the DOT Industry Codes and Descriptions. This section lists the types of industries, busi-

nesses, firms, companies, agencies, organizations, institutions, or other places or situations in which people in the occupations within the cluster can be found.

#### What The Work Place Is Like

This section describes aspects of the work environment and the work situation that are unusual, unpleasant, potentially dangerous, or otherwise noteworthy. A narrative format with short, simple sentences is used. This section answers such questions about the work environment as:

- (1) Is the work performed indoors, out-of-doors, or both?
- (2) Are the people in these occupations exposed to extremes of temperature or to temperature changes?
- (3) Is the work environment wet or humid?
- (4) Are the people in these occupations exposed to noise or vibrations?
- (5) Are there hazards or potential hazards in the work place?
- (6) Are the people in these occupations exposed to fumes, odors, toxic conditions, dust and/or poor ventilation?
- (7) Are safety clothing or safety devices required on the job?
- (8) Is overtime, night, weekend, holiday, or shift work typically required? Is the work seasonal?
- (9) Are there any potentially stress-inducing aspects to the work? (For example, rush periods, emergency situations, high risk situations, etc.)
- (10) Are there any potentially unpleasant aspects to the work? (For example, working with injured, diseased, or dead people or animals, working with body fluids and tissues, working near animal wastes, etc.)

#### How You Would Prepare For and Enter This Work

This section is intended to provide information to individuals that will help them make decisions about career paths that are based upon a realistic appraisal of the preparation requirements for occupations, including education requirements, training

requirements, and experience requirements. Entries in this section are based primarily on information contained in two source documents: Volume II of the Dictionary of Occupational Titles, Third Edition and the Employment Outlook Handbook. Information is presented in narrative format. Where available, career ladder information was provided to tie occupations in the cluster to entry-level positions. In addition, the following types of information are presented:

- (1) experience requirements
- (2) education requirements
- (3) licensing and certification requirements
- (4) training requirements
- (5) length of training  
(This includes all types of training, including education, experience, and on-the-job training, unless otherwise specified.)

#### What Are Your Opportunities

This section contains information to inform the client of the next level position in the career ladder that may be attained through advancement from the occupation described. Information in this category came primarily from the Employment Outlook Handbook, which contains information that reflects the national situation, rather than the North Carolina situation, and that addresses only a subset of the occupations covered in the SOC. It is, therefore, planned that more complete, detailed, North Carolina-specific information be incorporated into this section as it becomes available.

#### What Else You Should Know

This section may contain one or both of two basic types of information:

- (1) State-specific information regarding licensing and certification requirements
- (2) Any information of special note that does not appropriately fit into any other section.

Specifically, occupations for which a license or certificate is required are named (these are presented in all caps) and any prerequisite requirements (e.g., passing a test, working as an apprentice, degrees, or special programs that must be completed, etc.) are described. The name of the licensing board is also given for some of the occupations.

#### SOC Code

This section contains the SOC code for the cluster.

#### DOT Occupations

This section lists the three-digit DOT codes for the occupations covered by the SOC cluster description. This provides the counselor (or client) with a ready means of reference to the three-digit level DOT descriptions which may be relevant to the cluster.

## IV

### THE EMPLOYMENT OUTLOOK SECTION

by

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#### Introduction - A Lesson on Supply and Demand

The employment outlook was determined by relating two elements, SUPPLY and DEMAND. Supply and demand are the core of labor market information. To choose a career, to counsel someone about a career choice, or to plan programs for career training one should have some notion about the number of jobs available in an occupation in relation to the number of people trained to fill these jobs. Supply and demand analysis provides this information. The National Occupational Information Coordinating Committee, NOICC, considers supply and demand to be the main ingredients to be included in an Occupational Information System, OIS. Because of the importance of supply-demand analysis in making career choices, in counseling about careers, and in planning training programs, we felt that an introductory review of the principles of supply and demand would be helpful. The following discussion contains a brief treatment of the principles of supply and demand, how they relate to the system into which they are inputs, the OIS, and how they are to be interpreted for career decision-making and planning. The major purpose of this discussion is to explain how the EMPLOYMENT OUTLOOK was determined.

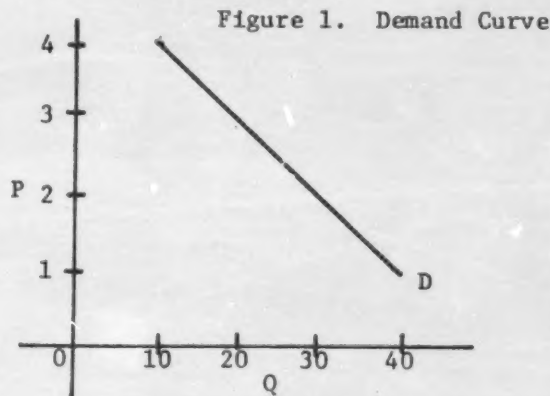
#### Current Supply and Demand

##### A. Price Determination by Supply and Demand - An Economic Model

It is customary for economists to talk about the supply-demand interaction. In the usual supply-demand model, the quantity of a particular good or service varies according to price. On the demand

side, as the price of the good goes up, the amount or quantity which people are willing to buy goes down. Conversely, as the price goes down, people are will to buy more. We thus speak of an inverse relationship between price and quantity: as one goes up the other goes down and vice-versa. The commonsense explanation of this is that as the price goes down (1) the good or service becomes cheaper with respect to other goods or services and there is a tendency to substitute the less expensive products for the more expensive ones; (2) as the good or service becomes cheaper, there is more income left and there is a tendency to buy more. This process is reversed when the price is raised. The demand situation is usually pictured in the following manner:

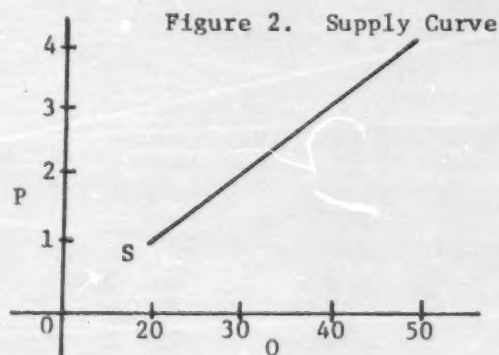
| <u>Demand Schedule</u> |          |
|------------------------|----------|
| PRICE                  | QUANTITY |
| P                      | Q        |
| \$4                    | 10       |
| \$3                    | 20       |
| \$2                    | 30       |
| \$1                    | 40       |



At a price of \$4 a quantity of 10 is demanded; at a price of \$3, a quantity of 20 is demanded, and so on.

On the supply side, as the price goes up the quantity which producers of the product or suppliers of the resource are willing to sell goes up and vice-versa. There is a direct relationship between price and quantity: as one goes up the other goes up and vice-versa. The commonsense explanation of this is that usually, it takes a higher price to coax resources from alternative uses or occupations. Thus, to get additional quantities of a resource, one must often pay more. The supply situation is usually pictured as follows:

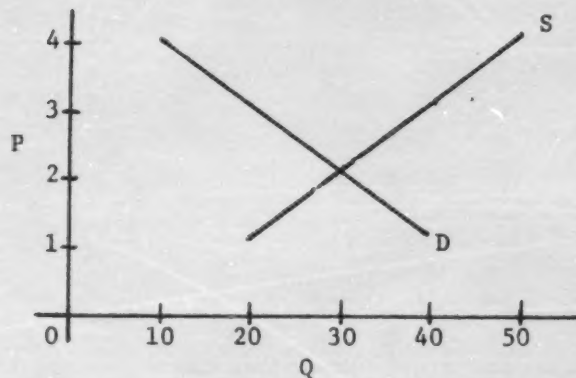
| <u>Supply Schedule</u> |          |
|------------------------|----------|
| PRICE                  | QUANTITY |
| P                      | Q        |
| \$4                    | 50       |
| \$3                    | 40       |
| \$2                    | 30       |
| \$1                    | 20       |



At a price of \$1 a quantity of 20 is supplied; at a price of \$2 a quantity of 30 is supplied, and so on.

The "interaction of supply and demand" is a phrase used by economists to describe how price is determined in certain markets. We put supply and demand on the same graph and talk about what happens between them when price changes. Demand indicates the quantities of a good or service which people are willing to buy at various prices. Supply indicates the quantities of a good or service which people are willing to sell at various prices. If market forces are allowed to operate freely, a price will be established which equates supply and demand. This is a price at which the amount which people are willing to buy is equal to the amount which people are willing to sell. This price is referred to as the equilibrium price. At any price higher than the equilibrium price, the quantity of the good or service which people are willing to sell is greater than the quantity which people are willing to buy (supply is greater than demand) and there is a surplus. At any price lower than the equilibrium price the quantity of the good or service which people are willing to buy is greater than the quantity which people are willing to sell (demand is greater than supply) and there is a shortage.

Figure 3. Supply and Demand Curves



In the graph above, \$2 is the equilibrium price, since supply (30) is equal to demand (30). At a price of \$3 the quantity supplied is 40 and the quantity demanded is 20. There is a surplus of 20. (Exercise: Reduce the price below \$2 and see what happens.) The price settles at \$2 because when it is higher, the surplus leads to competition among sellers - they lower the price. When the price is lower than \$2 the shortage leads to competition among buyers - the price is raised.

#### B. The Supply-Demand Interaction In an OIS

The supply-demand interaction in an OIS has some dissimilarities and similarities to the above model. It is unlike the model in several respects. In the first place, supply and demand are not defined relative to the single variables of price or quantity. In the second place, supply and demand do not intersect at a single

equilibrium price established by market forces. In the third place, supply and demand refer to the supply of people and the demand for people for certain occupations under given conditions of wages, hours of work and other economic, political and institutional settings.

The terms occupational supply and occupational demand are used to indicate that we are talking about occupations. Occupational supply and demand are best thought of as measurements of numbers of individuals available to work in an occupation (supply) compared to the number of jobs available in that occupation (demand). These measurements are best conceived as flowing into an occupational information system. When this system is a computer, the supply-demand interaction is sometimes referred to as the supply-demand interface.

Occupational supply is the estimated number of persons available to work in an occupation from various sources. These are the completers of training programs, graduates of community colleges and technical institutes, graduates of colleges and universities, occupational transfers and persons available from the unemployed ranks - all the potential entrants into an occupation. Occupational demand is the estimated number of workers needed to meet the requirements - expansion and replacement needs - within an occupation. This is the estimated number of job openings. To get the complete picture for purposes of career decision-making and planning, we match occupational supply with occupational demand.

The number of people who are already working in an occupation is included in the supply-demand statements. For example, assume that there are 15,000 persons currently employed as FINANCIAL MANAGERS. If expansion and replacement demand is 900 and the number of potential entrants is 300 then demand exceeds supply by 600. Total supply is current employment plus potential entrants or  $15,000 + 300 = 15,300$ . Total demand is current employment plus job openings or  $15,000 + 900 = 15,900$ . In Figure 4, "supply" is defined as potential entrants into an occupation. "Demand" is defined as job openings. The diagram thus compares potential entrants to job openings, given the current level of employment within an occupation.

Employment outlook is explained on the basis of the relationship between occupational supply and occupational demand. The existence of one of the following determines whether the employment outlook is favorable or unfavorable.

Consider the case in which supply equals demand. This means that the number of people trained to fill the jobs - or the potential entrants into an occupation - is equal to the number of jobs available or new openings.

Next, consider the case in which supply is greater than demand. In this case there is a surplus of workers or, what is the same thing, a shortage of jobs. The employment outlook is unfavorable because the number of people trained to fill the jobs - the potential entrants - is greater than the number of jobs available or new openings.

Finally, consider the case in which demand is greater than supply. In this case there is a shortage of workers (or a surplus of jobs). The employment outlook is favorable because there are more jobs available than there are people trained to fill them.

In the EMPLOYMENT OUTLOOK section, the number of people currently employed in the relevant occupation is indicated to give one a perspective of employment within that occupation. The employment outlook is described as FAVORABLE or UNFAVORABLE, depending on whether there are more jobs than people (FAVORABLE) or more people than jobs (UNFAVORABLE).

The following diagram shows the relationship between supply, demand, and the OIS. It shows supply, demand, and information supplementing supply and demand analysis, flowing into an occupational information system. These represent input flows. For purposes of this discussion, the only outputs we shall consider are the supply and demand interaction and wages. The data indicated by lines to supply and demand are estimates of numbers of people (supply) or jobs (demand). The abbreviations, UIS, VEDS, etc. indicate the following sources of supply:

- UIS - Unemployment Insurance Services
- USES - U.S. Employment Service
- VEDS - Vocational Education Data Systems
- CETA - Comprehensive Employment and Training Act
- HEGIS - Higher Education General Information Survey
- SNAPS - State and National Apprenticeship System

These represent data collection systems and, according to a policy statement by NOICC, are to be utilized, along with OES as a major source, as principal input data in the development of an occupational supply model of the OIS. Coding systems used by the data systems (included in parenthesis) are:

- DOT - Dictionary of Occupational Titles
- OES - Occupational Employment Statistics  
(of the Department of Labor)
- USOE - U.S. Office of Education
- CENSUS -

Agencies within the State of North Carolina were extremely helpful and cooperative in supplying information on supply and demand. These included the Employment Security Commission; the Division of

Community Employment; the State Board of Education; the Department of Public Instruction; Vocational Rehabilitation Services; the Department of Labor; the Division of Aging; the Division of Youth Services; the Division of Services for the Blind; the Division of Policy Development and Management; the Division of State Budget and Management; all licensing boards; the University of North Carolina, General Administration. These agencies supplied supply and demand data through the records they kept on through the systems they had in place.

In the diagram, supply and demand are not plotted on a graph with price measured in one direction and quantity in another. The diagram indicates the components of supply and the components of demand, i.e., what make up supply and demand. This method was chosen as a convenient way of depicting the supply-demand relationship. It has the additional advantage of facilitating the description of surplus and shortage. Above the OIS circle, supply is greater than demand. If we consider going from left to right across the page as increasing quantity, we can see that the total number of people completing such programs as CETA is greater than the number of people demanded for expansion and replacement needs. Below the OIS circle demand is greater than supply - there are more jobs than people. (See Figure 4. Supply and Demand Model on pg.7)

Supplementary supply and demand information enables one to get a better handle on supply and demand. On the supply side, one cannot take the entire population of college graduates within a discipline, for example, accounting, as the supply of accountants from colleges within that state. Follow-up studies of graduates (where available) indicating (1) the number of graduates remaining in the state, and (2) the number of graduates remaining in accounting will give a truer picture. Similarly, entrance into some occupations such as the legal and medical professions can be gained only by licensing within those occupations. Hence, the need for licensing information. In North Carolina special studies are available on occupations such as nursing, teaching, and others. The results of these studies were used to complete the supply and demand picture for these occupations. Population estimates and estimates of labor force participation by age and occupation help in making supply projections, discussed below.

On the demand side, supplementary information on the state's income or other specific variables is needed in demand projections if one is using a projection model developed specifically for a particular state. This supplementary information must be entered into OIS.

In the future when occupational supply and demand are broken down by sub-state areas such as by planning regions and SMSAs in North Carolina, appropriate formulas will be entered into OIS for doing this.

DEMAND (Job Openings)

(Potential Entrants) SUPPLY

CURRENT:  
EXPANSION, REPLACEMENT NEEDS (OES, CENSUS)

LONG TERM:  
BLS PROJECTIONS (OES, CENSUS)

SHORT TERM:  
INTERPOLATING BLS  
LONG TERM PROJECTIONS  
ECONOMETRIC MODELING  
USING STATE SPECIFIC  
VARIABLES

- UIS (DOT)  
VOC. ED (USOE)  
VEDS (USOE)  
OES (OES)  
USES (DOT)  
CETA (DOT)  
HEGIS (HEGIS)  
SNAPS (DOT)  
WIN (DOT)  
PRIVATE TRAINING PROGRAMS  
VOCATIONAL REHABILITATION (DOT)  
LABOR UNION TRAINING PROGRAMS

# OIS ANALYSIS

OCCUPATIONAL MOBILITY (CENSUS)  
PRIVATE SCHOOL (NON COLLEGE) GRADS (USOE)  
MILITARY OCCUPATIONS  
LABOR SUPPLY SURVEYS  
STUDENT FOLLOW-UP DATA  
GEOGRAPHIC MIGRATION (CENSUS)  
LABOR FORCE PARTICIPATION BY AGE AND OCCUPATION  
POPULATION ESTIMATES  
OCCUPATIONAL SUPPLY BY SUB-STATE AREAS

OCCUPATIONAL DEMAND BY  
SUB-STATE AREAS

35 SUPPLY (Potential Entrants)

Figure 4. Supply and Demand Model

(Job Openings) DEMAND

Since supply and demand must be matched to determine surpluses and shortages, they must be entered into OIS on a comparable basis. This is why definitions and procedures for collecting and projecting should be standardized. Whatever standard has been accepted, all information flowing into the system must be in standard form. This necessitates cross-coding or translating into standard form information from CETA, OES, HEGIS, and other supply and demand information.

Standardization may be accomplished in either of two ways: (1) by establishing direct code cross-walks, or (2) by occupational clustering. The variety of coding structures of supply and demand data is presented in the supply-demand chart. The direct cross-walk method involves a direct linkage between coding structures. For example, to convert all supply-demand data to DOT structure, a crosswalk from OES and CENSUS (demand data from expansion and replacement needs) to DOT, and from USOE and HEGIS (supply data) to DOT has to be made.

Occupational clustering involves grouping occupations according to common skill requirements or work performed. These groupings or clusters are then matched for supply-demand analysis. Existing coding techniques or classification structures are used in clustering. The most comprehensive cluster system is the SOC, which groups occupations according to similarity in worker activity. DOT occupations are grouped into SOC codes according to work-related functions. Just recently developed, the SOC will undoubtedly go through several modifications. Additionally, states may desire to set up sub-clusters within the SOC clusters according to more specific categories. The SOC/DOT structural arrangement or some modification of it seems the logical way to go on a national level.

OIS Analysis is a physical location where supply and demand are brought together. The purpose of the OIS is to provide a centralized facility which incorporates standard definitions and utilizes a procedure by which occupational supply and demand data systems can "talk to each other." In North Carolina supply and demand analysis is soon expected to be accomplished through centralized computer facilities.

#### Projected Supply and Demand

Today's supply and demand data tell us what the employment outlook is today. What will it be tomorrow? The answer to this question is needed by the job seeker, the planner and the counselor.

One method is already established on a national level for making long-term demand projections. All state Employment Security agencies (SESAs) are required to make long-term projections of five or more years and to update them every other year. Most of the Employment Security Agencies including North Carolina's use a method provided by the Bureau of Labor Statistics. The data for these projections are census-based and are manipulated through an industry/occupation employment matrix system. Short-term projections

are made from the long-term projections through simple interpolation. Demand projections in the EMPLOYMENT OUTLOOK section are based on the North Carolina Employment Security Commission's estimate of occupational employment for 1985.

Econometric models may be used to make short-term and long-term occupational demand projections. These models utilize functional relationships between state specific economic variables such as income and product. Where such models are used, variable information and functions are inputted into the OIS.

Supply projections are sometimes ignored by analysts of occupational supply and demand. The reason often given is the ability of administrators to change the supply. If training program directors, counselors and planners who utilize supply and demand data, see an imbalance between supply and demand there are several ways to affect the imbalance. CETA and other training program directors can simply reduce or cut out programs that are training for occupations for which there is a great surplus of people available for jobs. Counselors can acquaint job seekers of the situation and discourage them from going into these occupations. People can be encouraged to enter programs for which there is a surplus of jobs. In this way, supply can be brought more in line with demand. The point is that agencies often have considerably more control over occupational supply than over occupational demand.

Overlooking supply projections does not appear to be the better alternative. Program planners, trainers and other decision makers must get used to utilizing supply and demand projections for decision-making before we can assume that they will automatically change their programs in accordance with supply-demand calculations. In other words, the case for projecting supply rests on the assumption that the determinants of supply will remain the same. The assumption is "if the present trend continues there will be X number more welders than there are welding jobs." This is justification enough for making supply projections. Planners and program directors can see what the supply-demand picture would be like if there is no action taken to influence the imbalance. Because training program directors are likely to take action to influence the supply-demand interaction, projections must be frequently updated. At some point in time as projection methods become more sophisticated and as program directors, counselors and planners exert more planned influence on the supply-demand imbalance, some techniques will need to be developed to include the effects of the influence of planners, and so on in the model used to make the projections.

If one wants to project supply, an estimate must be made of all the components of supply: completers of training programs, job applicants from the unemployed ranks, migrations to an area, occupational transfers, and so on. Such estimates can be made on

the basis of past history and on the basis of planned programs. Longer term projections involve some estimate of the population and the labor force participation of this population by age and occupation. For example, consider the simplest case of projecting occupational supply, that of assuming that the components of supply do not change in their percentage of total supply or that the total supply remains the same. Then the procedure for projecting supply involves: expressing the total current supply within an occupation as a percentage of the labor force within the relevant age category, projecting labor force participation in the population for the year in which the supply projection is to be made, and calculating from this population projection the projected supply within the occupation.

In the EMPLOYMENT OUTLOOK section, supply and demand are projected through the year 1985. This period is referred to as the early 1980's. Supply and demand interaction is stated in terms of how many more jobs there are expected to be than people (FAVORABLE outlook) or how many more people there are expected to be than jobs (UNFAVORABLE outlook).

Forty-nine occupations for which the employment outlook in North Carolina is expected to be favorable were identified. These are occupations for which a worker shortage of approximately 80 or more is expected through the year, 1985. The 49 "North Carolina-Favorable" occupations are highlighted in the Occupational Information File by: (1) asterisks preceding cluster titles in the two indices and (2) asterisks preceding cluster description titles. The "North Carolina-Favorable" occupational clusters are shown in Appendix E, which lists the figures for total estimated employment for 1978 and 1985 and the estimated worker shortage for these years.

#### Interpretation and Analysis of Supply-Demand Interaction

From the above matching of supply and demand one will emerge with numbers for each occupation or occupational cluster considered. Such numbers will show that there is either a surplus or shortage of jobs. Although estimates may be inaccurate due to the faults of estimating procedures, it may be more useful to report numbers rather than merely to state that supply exceeds demand or that demand exceeds supply. In the first place, numbers give the job seeker, training agency, or counselor an idea of the extent of job availability (3000 more or fewer jobs or 100 more or fewer jobs in an occupation is a quantitative difference that should not be ignored by job seekers, counselors or planners of training programs). In the second place, quantitative statements enable one to compare opportunities in different occupations. In more than 20,000 occupations, the statement that supply exceeds demand or some similar statement, gives no indication of the relative importance of occupations in terms of employment outlook. In the third place, having developed the statistics to enable one to assert that

supply exceeds demand, why not state the extent to which supply exceeds demand? Our quantitative methods should improve in time. Meanwhile, if we have extended ourselves enough to quantify the occupational demand and supply situation, we should stand by it. This should develop confidence in and respect for our estimates and procedures. Finally, numbers enable us to see trends more readily.

The supply-demand information is useful to several groups: to vocational administrators and planners in helping them to determine which programs will maximize student placement; to industry in helping to assess labor market conditions; to training agencies in indicating the most suitable occupations for training; to vocational and career counseling personnel in providing individuals with sufficient employment outlook information; to workers and potential workers in providing information on employment opportunities.

As supply-demand information is made available, it is important that all agency administrators involved in training look at data as a group rather than in isolation as individual members. Percentage training shares by individual agencies should be considered when actions are taken to increase or decrease training. If there is a surplus of jobs in one occupation and five different agencies increase the number of people trained for this occupation without collaboration, there could develop a surplus of workers trained. It is important that agencies work together in training, particularly in response to supply-demand calculations.

#### Limitations of Supply-Demand Analysis

The major limitation of supply-demand analysis is that supply and demand are estimates. Current demand is an estimate of expansion and replacement needs in occupations, based on only a sample of the population of occupations. This makes the estimate subject to sampling error as well as to reporting errors. Long-term demand involves estimating for the future and is subject to even more errors. Econometric modeling techniques are subject to errors of measurement as well as of possible faulty functional relationships.

Supply estimates may suffer from reporting errors, lack of reporting, absence of any information on some groups including the unemployed who have become discouraged and have stopped looking for work and the underemployed. It is likely that supply for many occupations may be seriously understated because of the inability to identify some components.

Both supply and demand estimates may suffer from imprecise or inadequate demographic information. One should be cautious,

therefore, in utilizing the results of the supply-demand analysis. It should be remembered that the estimate is, at best, an approximation and its validity often depends on the closeness of the approximation to reality.

#### Wage Information

Wage data contain the following information where available: the hourly wage and the associated yearly wage for job openings (in ranges); the hourly wage and associated yearly wage for all jobs (in ranges); the statewide hourly average wage and the associated yearly wage. This information was obtained entirely from North Carolina Employment Security information.

At the writing of this description, information was still being collected for some clusters. Additionally, there are some SOC listings for which there are no clusters in North Carolina. For these reasons all clusters do not contain outlook and wage information.

## THE DISABILITY SECTION

By

Sol Richman  
Psychologist & Rehabilitation Counselor

B.S., College of the City of New York, (Premedical Sciences and Pedagogy, Education Psychology); M.A. New York University (Vocational Rehabilitation); Ph.D.(ABD) New York University (Rehabilitation and Administration); Registered and Licensed Psychologist, New York and North Carolina; Elected to American Men and Women of Science (Psychology) and Fellow of AAMD; Varied experience in vocational rehabilitation counseling, administration, and consultation.

Purpose

There are four reasons for including the abilities of disabled persons in the job cluster descriptions:

1. To help disabled and normal persons understand that there are only two kinds of handicaps--a lack of job skills and the lack of social skills in a job setting.
2. To help counselors understand the difference between disability and handicap. Disability is a person's specific physical, mental or emotional condition such as a missing limb or a learning disability. A handicap is a person's limitations imposed by the disability. A disabled client and the job demand which create a handicap are adjustable.
3. To help people in business and industry realize that equipment, layout, and personnel policies can be adaptable to both the normal and the disabled person's needs. Adaptation by business and industry means a broader labor pool and greater profits. Adaptation such as removing architectural barriers and creating flexible work schedules are a part of the social obligation and responsibility that comes with the receipt of a public license or permit to operate a business.
4. To show people that disabled people are also part of the community. Through work, disabled people can contribute to and become part of both the economic and the social community.

In failing to fit the person to the job and the job to the person, society through business and industry, is limiting the greatest use of the abilities of disabled people.

## DISABILITY AND HANDICAP: TWO DISTINGUISHABLE CONCEPTS

Disability and handicap are not interchangeable terms. They are each descriptive terms that reflect two separate dimensions of an individual's limitations. Persons with identical disabilities are not necessarily equally handicapped.

The term disability describes a specific physical, mental, or emotional condition or a combination of such conditions. Often, special restorative services may reduce or eliminate such impairments. The disability of an amputated limb may be reduced through the use of prosthesis; a mental condition may be improved through training and socialization; an emotional condition may be reduced or eliminated by therapy and positive experiences. The individual with his residual disability must now apply himself and his skills in a job milieu. When such a person can do only the core duties of a job and none of the peripheral duties, that person may be considered handicapped only for selected aspects of the job.

The handicap, then manifests itself in the disabled person's inability to perform specific parts of a job. The response to a handicapping condition then becomes a function of the disabled individual's perception of his own abilities in a job setting and the willingness and capacity of the supervisory staff in the job environment to modify job duties to accommodate to the residual abilities of the disabled worker. Therefore we may only use the term "handicap" in the context of "handicapped for what specific activities."

Thus the disabled clerical worker who cannot bend, reach, or carry can perform the essential (core) clerical duties but may require the assistance of a co-worker to file or to obtain specific office books or material. Similarly, the wire plater who is able to have someone else refill his machine with rolls of wire and covering material can be an effective plater even if he can only sit and operate the machine.

In sum, a disability is the remaining physical, mental, or emotional condition, whereas a handicap may be imposed by the disabled on himself or by the employer's perception of disablement--both subject to education and change.

## A DISABILITY PHILOSOPHY

...IT IS NOT WHAT YOU HAVE LOST THAT MATTERS  
BUT WHAT YOU HAVE LEFT THAT COUNTS

--Mary E. Switzer

Writing is an act of faith and reflects both a belief in the contents of and a trust in the reader's willingness to act on it.

Professional evaluation of the ability of the disabled is also an act of faith: in the disabled and his determination to maximize his residual abilities and in the community's willingness and ability to change and accommodate the disabled, not as an act of charity but one of good business that insures a stable and effective work force. Research and experience have long established that, when properly placed, the disabled become efficient employees with lower turnover and absentee rates than other workers.

Philosophy in the past has often held that the worker must always meet and adjust to all aspects of a job. This has given way to the realization that job duties are flexible and can be adjusted to the special needs of the worker. In this context, a handicap is an attitude and limitation created by man himself and not necessarily inherent in a disability or related to the core duties of a specific job.

It is posited that the disabled are not "round pegs" and industry, business, and labor are not "square holes" in terms of rigid adherence to a job description. The employer community is doing job modification and job reengineering all the time to meet its production and employee needs. It behooves the disabled, the employment counselor, and other significant helping professionals to recognize that fact and examine all jobs under consideration in terms of their core duties rather than in terms of all job duties in the description. Such an approach would open greater job opportunities for the disabled through reassignment of some duties, job modification, and job reengineering.

For example, jobs that require manual and finger dexterity as core duties and also call for lifting, carrying and walking, can be subject to reassignment by having materials and finished work delivered and taken off by another worker. As a result the core duties become a bench or assembly job. A case in point is the occupational cluster, Plating and Coating Machine Operators and Tender. The core duties involve machine operations, tending and inspection. The aspect of loading and unloading the coils of material and removing the finished product can be performed by another employee and open jobs to the disabled who are handicapped in terms of carrying, lifting, and walking. In fact on a production line of workers in this cluster, industry can designate an employee to do the loading and take-off as a means of increasing the productivity of each machine operator. Similarly the inspection and assembly industry, among others, has developed a whole series of jigs and fixtures that facilitate production and minimize the worker's movement and judgment with respect to size, shape, and placement of material in the production process.

Industry already uses the technique of job modification and re-engineering in its analysis of production and efficiency. It is a logical next step to emphasize, use, and expand these existing industrial techniques as a means of making the disabled more functional and placeable. We need only expand the awareness of the disabled, the counselor, and the employer to the existing possibilities in the work process.

Expanding employment opportunities for the disabled through duty reassignment, job modification, and job reengineering is only one side of the coin. Equally important is the ability to match residual abilities with job demands on a sound and realistic basis. To obtain these abilities and limitations, current practice includes utilization of a comprehensive physical, mental, and personality (emotional) examination. As thorough as these examinations may be, too often they are not done in the context of the core and peripheral duties of an occupational cluster or specific job component. To provide a report that is useful to the counselor and counselee in terms of occupational planning, the examining medical specialist and psychologist or other professional must appreciate the projected job environment, the inter-relationships that are involved, the attributes required, and the modifications that are possible. Without such background, the examiner is examining the heart and other organs; the range of motion of limbs; amputations and use of prosthetics; visual, speech and hearing impairments; and emotional limitations. Such reports, given without an occupational frame of reference, are difficult to interpret and can easily be misinterpreted.

To rectify this problem, it would appear mandatory for the counselor to move the counseling process and the counselee to the consideration of tentative job cluster or clusters or a specific job objective based on use of existing medical, psychological, and vocational data. Such tentative objectives and demands, when described, would enable the examiner to evaluate the counselee more specifically and to provide details on abilities, limitations, and environmental restrictions. The counselee will feel more involved in the counseling process, sense its direction and movement, and participate in the examinations as a significant step toward his job goal.

All the occupational clusters and their individual component jobs and their demands must be viewed as modifiable in terms of some aspects beyond the core duties.

In the occupational cluster descriptions, the section with respect to the disabled and their handicaps are deliberately brief and simplistic. It emphasizes the need to evaluate each job duty - particularly those under the heading, "What Specific Activities You May Perform" - and the modification that may be possible. It is not an attempt to provide specific solutions. Research and experimentation on job modification and reengineering is an ongoing process. Even a how-to-do-it book can do no more than generate ideas as a take off point for approaching individual problems. The reader's ingenuity, experiences, and approaches will encourage explorations for job modification in industry and attitude changes in the general community. State Employment Security Commissions and the State Vocational Rehabilitation Agencies stand ready to provide consultation and other resources to educate the community and to assist industry in job modification and reengineering in order to maximize the placeability of the disabled.

A community must be committed in its belief in the ability of the disabled to become full contributing members of society and the social value of utilizing each individual's contribution. We will then demonstrate with Emerson, "That men in all ways are better than they seem".

APPENDICES

APPENDIX A

SIGNATORY COMMITTEE MEMBERS AND ALTERNATES OF THE NCSOICC

Signatory Committee Members of the NCSOICC

Secretary Joseph Grimsley  
Department of Administration  
Chairman

Preston Johnson  
Alan Hill  
Bob Philbeck  
Eva Clayton

Employment Security Commission  
State Board of Education  
Vocational Rehabilitation Services  
Department of Natural Resources  
and Community Development

Signatory Committee Alternates of the NCSOICC

Assistant Secretary Arnold Zogry  
Department of Administration  
Alternate Chairman

Dave Garrison  
Cliff Belcher  
Joe Morrow  
Charles Parker

Employment Security Commission  
Department of Public Instruction  
Vocational Rehabilitation Services  
Division of Community Employment

# APPENDIX B

## STATE AND LOCAL TECHNICAL ADVISORY COMMITTEE

| <u>AGENCY</u>                      | <u>STATE</u>                                                                                              | <u>LOCAL</u>                                                                       |
|------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Public Instruction                 | Cliff Belcher<br>Education Building<br>ext. 7094                                                          | John Worthington<br>Vocational Education<br>Kinston, NC<br># 523-9001              |
| Community Colleges                 | Ken Oleson<br>Education Building<br>ext. 3995                                                             | Edward Wilson, Jr.<br>Wayne Community College<br>Goldsboro, NC<br># 735-5151       |
| Community Development              | Bill Fleming<br>114 Morgan Street<br>ext. 4524                                                            | Doug Hearn<br>Human Services Department<br>Winston-Salem, NC<br># 727-2886         |
| Employment Security Commission     | Dave Garrison<br>Green Building<br>ext. 2936                                                              | Ann Colenda<br>Labor Market Division<br>Durham, NC<br># 683-6880                   |
| Vocational Rehabilitation Services | Joe Morrow<br>620 N. West Street<br>ext. 5920<br><br>Jay Collins<br>436 N. Harrington Street<br>ext. 7807 | Landis Barnes<br>Vocational Rehabilitation<br>Services<br>Durham, NC<br># 683-6810 |

APPENDIX C  
TASK FORCE MEMBERS

|                       |                                                                 |                |
|-----------------------|-----------------------------------------------------------------|----------------|
| Hugh Harris           | Continuing Education<br>N.C. Central University                 | #683-6096/6275 |
| Charles Law           | Public Instruction                                              | ext. 7362      |
| Jerry Kivett          | Public Instruction                                              | ext. 7094      |
| Michael Swaim         | Employment Security -<br>Occupational Field Center              | ext. 7917      |
| Jean Leigh            | Public Instruction                                              | ext. 4396      |
| Raymond Jeffries      | Public Instruction                                              | ext. 3345      |
| Tom Vass              | Department of Labor                                             | ext. 7495      |
| Bill Vinson           | Employment Security                                             | ext. 3598      |
| Paul Cline            | Vocational Rehabilitation                                       | ext. 7807      |
| Landis Barnes         | Vocational Rehabilitation<br>Durham                             | #683-6810      |
| Brooks Whitehurst     | Business & Economic Community<br>(Texas Gulf, Inc.)             | #782-7070      |
| Robert Parker         | Business & Economic Community<br>(Corp of Engineers-Wilmington) | #343-4923      |
| Lester Moore          | CETA<br>Duplin County                                           | #289-3915      |
| Mildred Fain          | CETA<br>Rowan County                                            | #704-633-6633  |
| Thelma Lennon         | Public Instruction                                              | ext. 4396      |
| Jerry Wright          | State Advisory Council on<br>Vocational Education               | #737-2495      |
| Jill Roberts          | Business & Economic Community<br>(Tanger Creighton Industry)    | #349-8275      |
| Larry Shelton         | Business & Economic Community<br>(IBM)                          | #836-2796      |
| Darrell Myrick        | Department of Administration<br>Budget                          | ext. 4020      |
| Kate Sterling         | Employment and Training Office<br>Durham                        | #683-1576      |
| Mary Elizabeth Noonan | Department of Labor                                             | ext. 7495      |
| Don Alteri            | Caldwell Community College                                      | #704-728-4323  |
| Rich Amico            | Business & Economic Community<br>(Corp of Engineers-Wilmington) | #343-4871      |
| Nancy Drod            | Davidson Community College                                      | #704-249-8186  |
| Phil Greenhill        | Department of Human Resources                                   | ext. 4555      |

# APPENDIX D

## THE SOC DESCRIPTION WRITERS

| NAME             | TITLE                    | EDUCATION                                                        | EXPERIENCE                                                                                                           | Employer                                                                                                                                                                                         |
|------------------|--------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Walter T. Boykin | Description Writer       | B.A., Business/Personnel Management                              | Occupational Analyst IV; Employment Interviewer ; Veteran's Representative                                           | -Employment Security Commission                                                                                                                                                                  |
| Carmen F. Comer  | Reading-Level Specialist | M.A., Reading<br>B.S., Social Work                               | -Supervisor<br><br>-Instructor of Reading<br><br>-Leader for Reading Program                                         | -Skills Improvement Center, NC A & T University<br><br>-St. Augustine's College<br><br>-Atlanta Public Schools Atlanta, Georgia                                                                  |
| Allen R. Curry   | Description Writer       | Ed. D., Research Design<br>M. Ed. Counseling<br>B.S., Psychology | -Partner<br><br>-Senior Professional<br><br>-Research Assistant                                                      | -Atlanta Public Schools Atlanta, Georgia<br><br>-Systems Oriented Measurement and Analysis (SOMA)<br><br>-National Testing Service<br><br>-Educational Research Laboratory University of Georgia |
| Robert P. Daves  | Description Writer       | M.A. Candidate in Journalism<br>B.S., Sociology                  | -Teaching Assistant<br><br>-Editorial Assistant<br><br>-Reporter/Sports<br><br>-Editor; District Circulation Manager | -UNC Journalism School<br><br>-Public Information Office Western Carolina Univ.<br><br>-The Daily Independent, Kannapolis, NC                                                                    |

# APPENDIX D (cont.)

## THE SOC DESCRIPTION WRITERS

| NAME            | TITLE                                | EDUCATION                                                                                           | EXPERIENCE                                                              | Employer                                                                                                                                                                                           |
|-----------------|--------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| James A. Lofton | Description Writer                   | M.A. Candidate in Journalism<br>B.A., Modern Language                                               | -Summer Spanish Teacher                                                 | -Virginia Military Inst.                                                                                                                                                                           |
|                 |                                      |                                                                                                     | -English Teacher/Coach                                                  | -Lexington High School<br>Lexington, NC                                                                                                                                                            |
|                 |                                      |                                                                                                     | -Contributor                                                            | -North Carolina <u>Anvil</u><br>Newspaper                                                                                                                                                          |
| Alan Ogus       | Description Writer                   | Ph.D (ABD), Psychology<br>M.A., Psychology<br>B.S., Chemistry                                       | -Psychologist                                                           | -Mental Retardation Service<br>Dorothea Dix                                                                                                                                                        |
|                 |                                      |                                                                                                     | -Unit Psychologist                                                      | -Western Carolina Center                                                                                                                                                                           |
|                 |                                      |                                                                                                     | -Research Associate                                                     | -Appalachian State Univ.                                                                                                                                                                           |
| John F. Powell  | Description Writer                   | M.A., Journalism<br>B.A., History                                                                   | -Copy Editor/General<br>Assignment Reporter -<br>City Government        | -The <u>News &amp; Observer</u><br>Raleigh, NC                                                                                                                                                     |
|                 |                                      |                                                                                                     | -Reporter-Editor;<br>Sports Editor                                      | -The <u>Oak Ridger</u><br>Oak Ridge, TENN                                                                                                                                                          |
| Sol Richman     | Vocational Rehabilitation Specialist | M.A., Vocational Rehabilitn.<br>B.S., Premedical Science<br>and Pedagogy and Educational Psychology | -Consultant                                                             | -Social Security Administration, Bureau of<br>Hearings and Appeals;<br>Dept. of HEW, Office of<br>Human Services; Rehabilitation Services Administration; Office of<br>Developmental Disabilities. |
|                 |                                      |                                                                                                     | -Voc. Rehab. Specialist<br>and Special Assistant<br>to the Commissioner | -Rehabilitation Services<br>Administration; HEW;<br>OHD: RSA                                                                                                                                       |

# APPENDIX D (cont.)

## THE SOC DESCRIPTION WRITERS

| NAME                    | TITLE              | EDUCATION                                                                              | EXPERIENCE                                                                                                                                                                                  | Employer                                                                                                                                                                                                    |
|-------------------------|--------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                    |                                                                                        | Title                                                                                                                                                                                       |                                                                                                                                                                                                             |
| Sol Richman (continued) |                    |                                                                                        | -Chief, Bureau of Program Development; Consultant, Mental Handicap Program; Senior Rehab. Counselor, Hospital Programs, Rehab. Counselor (Neuro-Psychiatric and other special disabilities) | -New York State Education Dept., Office of Vocational Rehabilitation                                                                                                                                        |
|                         |                    |                                                                                        | -Faculty Lecturer                                                                                                                                                                           | -New York School of Psychiatry<br>New York, NY                                                                                                                                                              |
|                         |                    |                                                                                        | -Rehabilitation Expert                                                                                                                                                                      | -United Nations and International Labor Office<br>Geneva, Switzerland                                                                                                                                       |
|                         |                    |                                                                                        | -Fellow                                                                                                                                                                                     | -The American Association of Mental Deficiency                                                                                                                                                              |
| N. Blyth Riegel         | Description Writer | Ph.D (ABD), Psychology<br>M.A., Applied Statistics<br>B.A., Math / German / Psychology | -Educational Consultant and Partner<br><br>-Senior Professional Staff Member<br><br>-Graduate Research Assistant                                                                            | -Systems Oriented Measurement and Analysis (SOMA)<br><br>-National Testing Service<br><br>-Center for Occupational Education, N.C. State University; Department of Statistics, George Washington University |
| Cheryl B. Smith         | Description Writer | M.A. (ABT), Urban Geography & Housing<br>B.S., Geography                               | -Teaching and Research Assistant<br><br>-Management Information Specialist<br><br>-Research Analyst                                                                                         | -Geography Dept., UNC<br><br>-CETA<br><br>-Durham/Orange Employment & Training Office                                                                                                                       |

# APPENDIX E

## NORTH CAROLINA-FAVORABLE OCCUPATIONS

(Occupations in North Carolina for which the employment outlook is FAVORABLE. The following list includes those occupations for which there is expected to be a shortage of trained workers through 1985 of approximately 80 more).

| SOC # | SOC Name                                                 | N.C. Name (from ESC)                     | Total Employment |         | Work Shortage |      |
|-------|----------------------------------------------------------|------------------------------------------|------------------|---------|---------------|------|
|       |                                                          |                                          | 1978             | 1985    | 1978          | 1985 |
| 1190  | Gen'l. Public Admin. Officials & Administrators          | Public Officials & Administrators        | 6390             | 7630    | 136           | 176  |
| 1220  | Financial Managers                                       | Bank, Financial Mgrs., Credit Mgrs.      | 14,690           | 19,120  | 566           | 968  |
| 1281  | College & University Administrators                      | School Administrators, College           | 1,970            | 2,640   | 118           | 177  |
| 1359  | Service Organization Managers                            | Funeral Directors                        | 1,230            | 1,300   | 41            | 107  |
| 1390  | Officials and Administrators                             | Office Managers, General                 | 9,260            | 11,160  | 116           | 266  |
| 1412  | Accountants & Auditors                                   | Accountants                              | 15,650           | 17,730  | 148           | 320  |
| 1626  | Chemical Engineers                                       | Chemical Engineers                       |                  |         |               |      |
| 1628  | Civil Engineers                                          | Civil Engineers                          |                  |         |               |      |
| 1639  | Applied Engineers                                        | Engineers, Other                         | 7,960            | 9,290   | 56            | 162  |
| 1633  | Electrical & Electronic Engineers                        | Electrical Engineers                     | 5,720            | 7,010   | 42            | 114  |
| 1721  | Operations Researchers & Analysts                        | Operations, Systems Research             | 1,940            | 2,730   | 34            | 107  |
| 1733  | Statisticians                                            | Research Workers, Statisticians          | 5,430            | 6,860   | 275           | 468  |
| 2042  | Clergy                                                   | Clergy                                   | 10,470           | 13,470  | 676           | 960  |
| 2400  | Vocational & Educational Counselors                      | Vocational Education Counselors          | 2,780            | 3,710   | 73            | 175  |
| 2510  | Librarians                                               | Librarians                               | 4,480            | 5,220   | 98            | 209  |
| 2610  | Physicians                                               | Physicians, M.D. & Osteopaths            | 6,910            | 9,270   | 528           | 759  |
| 2620  | Dentists                                                 | Dentists                                 | 1,870            | 2,530   | 25            | 84   |
| 2900  | Registered Nurses                                        | Registered Nurses                        | 18,330           | 22,330  | 163           | 747  |
| 3020  | Dieticians                                               | Dieticians                               | 1,160            | 1,420   | 37            | 81   |
| 3719  | Engineering Technologists & Technicians                  | Engineering Science Technologists        | 8,860            | 11,320  | None          | 218  |
| 4163  | Street Vendors, Door-to-Door Sales & Related Occupations | Hucksters & Peddlers                     | 4,310            | 5,170   | 23            | 131  |
| 4222  | Insurance Salespersons                                   | Insurance Agents, Brokers                | 12,450           | 14,050  | 190           | 216  |
| 4259  | General Services Salespersons                            | Sales & Sales Workers, General           | 105,710          | 121,570 | None          | 836  |
| 4320  | Wholesale & Retail Trade Buyers                          | Buyers Shippers, Wholesale, Retail Trade | 3,930            | 5,060   | 156           | 158  |
| 4612  | Secretaries                                              | Secretaries, Legal, Medical, Other       | 88,040           | 114,600 | 2031          | 8948 |
| 4682  | Bank Tellers                                             | Bank Tellers                             | 9,530            | 11,880  | None          | 327  |
| 4694  | Library Clerks                                           | Library Attendants, Assistants           | 2,820            | 3,270   | 26            | 147  |
| 4695  | Teacher Aides                                            | Teacher Aides, Exc. Monitors             | 5,760            | 8,330   | 227           | 757  |
| 4713  | Payroll & Timekeeping Clerks                             | Payroll & Timekeeping Clerks             | 5,680            | 6,850   | 5             | 261  |

APPENDIX E (cont.)  
NORTH CAROLINA-FAVORABLE OCCUPATIONS

| SOC # | SOC Name                                       | N.C. Name (from ESC)                      | Total Employment |        | Work Shortage |      |
|-------|------------------------------------------------|-------------------------------------------|------------------|--------|---------------|------|
|       |                                                |                                           | 1978             | 1985   | 1978          | 1985 |
| 4717  | Statistical Clerks                             | Statistical Clerks                        | 6,370            | 7,140  | 51            | 223  |
| 4723  | Postal Clerks                                  | Postal Clerks                             | 5,510            | 5,870  | 136           | 137  |
| 4748  | Expeditors                                     | Expeditors, Production Control            | 5,120            | 6,200  | 2             | 109  |
| 4749  | Material Recording, Scheduling & Distr. Clerks | Ticket Station Express Agents             | 2,310            | 2,600  | 25            | 85   |
| 4783  | Non-Insurance Investigators & Adj.             | Estimators & Investigators                | 8,120            | 10,030 | 267           | 581  |
| 5213  | Waiters & Waitresses                           | Waiters                                   | 23,160           | 26,230 | None          | 177  |
| 5216  | Food Counter & Fountain Workers                | Food Counter, Fountain Workers            | 7,650            | 8,730  | 12            | 87   |
| 5232  | Dental Assistants                              | Dental Assistants                         | 3,200            | 4,240  | 37            | 306  |
| 5233  | Health Aides, Exc. Nursing                     | Health Aides, Exc. Nursing, Therapy Asst. | 4,190            | 5,520  | 199           | 465  |
| 5251  | Barbers                                        | Barbers                                   | 4,680            | 5,240  | 143           | 157  |
| 5252  | Cosmetologists & Beauty Workers                | Hairdressers, Cosmetologists              | 13,490           | 15,720 | 380           | 158  |
| 6717  | Heavy Equipment Mechanics                      | Heavy Equipment Mech., Incl. Diesel       | 37,960           | 43,930 | 189           | 248  |
| 6758  | Telephone Installers & Repairers               | Telephone Installers & Repairers          | 8,530            | 10,150 | 48            | 139  |
| 7251  | Hand Dressmakers                               | Dressmakers, Exc. Factory                 | 8,050            | 8,730  | 110           | 175  |
| 7252  | Tailors                                        | Tailors                                   | 3,460            | 4,070  | 36            | 87   |
| 7255  | Precision Laundering, Cleaning & Dying Workers | Dyers                                     | 6,890            | 8,230  | 259           | 295  |
| 7655  | Textile Sewing Machine Operators & Tenders     | Sewers & Stitchers                        | 81,510           | 98,890 | None          | 888  |
| 7656  | General Sewing Machine Operators & Tenders     |                                           |                  |        |               |      |
| 7820  | Production Inspectors, Checkers, Examiners     | Checkers, Inspectors, Other; Examiners    | 53,940           | 69,290 | 375           | 2547 |
| 8220  | Garbage Collectors                             | Garbage Collectors                        | 4,880            | 6,550  | 1             | 81   |
| 1310  | Medicine & Health Managers                     | Health Administrators                     | 3,900            | 5,000  | 319           | 450  |